## Journal of Microscopy

1973. Vol. 98 Contents and Indices

Joint Editors: B. Ralph, P. Echlin, E. R. Weibel (Stereology)

Editorial Advisory Board: G. C. Amstutz, R. Barer, V. E. Cosslett, B. C. Cowen, I. M. P. Dawson, M. J. Dobb, Audrey M. Glauert, R. W. Horne, D. G. Murchison, T. F. Page, A. G. E. Pearse, P. C. Robinson, P. R. Swann, E. E. Underwood

U. I. C. C. JUL 1 6 1974 LIBRARY



Published for the Royal Microscopical Society by Blackwell Scientific Publications Oxford London Edinburgh Melbourne

## Journal of Microscopy

Patron: HER MAJESTY THE QUEEN

Officers and Council 1973-74

President: A. G. E. PEARSE

Vice-Presidents: P. J. STOWARD G. L'E. TURNER

Hon. Treasurer: B. C. COWEN

Hon. Secretary: P. C. ROBINSON

Ordinary Members of Council:

R. H. M. ALDERSON
G. A. BASSETT
J. A. CHAPMAN
I. M. P. DAWSON
E. A. FOLLETT
B. G. FOOKES

Hon. Joint Editors:

B. RALPH

E. R. WEIBEL (Stereology)

P. ECHLIN

I. R. GARRETT

B. O. PAYNE

P. R. SWANN

A. W. ROBARDS

D. J. GOLDSTEIN
D. G. MURCHISON

Hon. Keeper of Films: D. J. TREVAN

Administrator: P. G. FLEMING

## Contents of Vol. 98

## Part 1

J. M. Johnson and D. F. Parsons. Enhanced contrast in electron microscopy of unstained biological material. III. In-focus phase contrast of large objects	1
S. RAMALINGAM, A. C. Bell and J. T. Black. Direct examination of chip formation during metal machining by scanning electron microscopy	19
DAVID C. SKILLMAN. The computation of particle size-shape distributions in transmission microscopy	31
JOHN A. A. HUNTER and BRYAN FINLAY. Identification of elastic tissue in human skin viewed in the scanning electron microscope	41
B. N. RANGANATHAN and HELEN E. GRENGA. Hydrogen-ion image features of tempered martensite	49
M. J. Fulker. A specimen scanner for stereology with the electron microscope	57
OSCAR W. RICHARDS. The Polanret variable densiphase microscope	67
A. G. Davies. Estimation of number and diameter of isodiametric particles in microtome sections	79
DIETER FROESCH. A simple method to estimate the true diameter of synaptic vesicles	85
BARBARA BOLE and ELIZABETH PARSONS. Scanning electron microscopy of the internal cellular structure of plants	91
Short Technical Notes W. ZEIDLER. The preparation of flexible thin sections of rocks and coals	99
RAJENDRA MEHTA. The usefulness of disposable syringes in the electron microscope laboratory	103
G. J. HILLS and R. T. GARNER. A design for a simple electronic exposure meter for use with an electron microscope	105
M. J. W. Webb. A method for the rapid removal of sugars and salts from virus preparations on electron microscope grids	109
Book Reviews	113
Part 2	115
Introduction	115
D. J. H. COCKAYNE. The principles and practice of the weak-beam method of electron microscopy	116
F. HÄUSSERMANN, K. H. KATERBAU, M. RÜHLE and M. WILKENS. Calculations and observations of the weak-beam contrast of small lattice defects	135

M. L. Jenkins, D. J. H. Cockayne and M. J. Whelan. The determination of the geometry and nature of small Frank loops using the weakbeam method	155
R. BICKNELL. Weak-beam observation of dislocation loops in silicon	165
I. L. F. RAY and D. J. H. COCKAYNE. Investigation of dislocation geometries in the diamond cubic structure	170
R. G. Campany, M. H. Loretto and R. E. Smallman. The determination of the $\frac{1}{2}\langle111\rangle$ {110} antiphase boundary energy of NiAl	174
P. GUYOT. Observations of lattice defects using the weak-beam technique	180
A. G. Cullis. Transmission electron microscope observations of extended and unextended dislocation nodes in Si and Ge/Si layers using the weak-beam technique	191
R. C. Crawford, I. L. F. Ray and D. J. H. Cockayne. Four-fold dissociations of super-lattice dislocations	196
R. C. Perrin and B. L. Eyre. The application of weak-beam imaging to studies of small dislocation loops	200
J. L. Martin. Evidence of dislocation dissociation in nearly stoichiometric tantalum carbide using the weak-beam technique	209
R. C. Perrin and E. J. Savino. Computer simulation of weak-beam images of extended dislocations in copper	214
I. NORDLANDER and A. Thölén. Resolution of dense dislocation networks using the weak-beam technique	221
T. JOHANNESSON and B. LEHTINEN. Dislocation networks in tungsten carbide studied by the weak-beam technique	226
Book Reviews	229
Part 3	
Introduction	231
T. Mulvey. Instrumental aspects of image analysis in the electron microscope	232
R. E. Burge. Mechanisms of contrast and image formation of biological specimens in the transmission electron microscope	251
R. W. HORNE. Contrast and resolution from biological objects examined in the electron microscope with particular reference to negatively stained specimens	286
P. N. T. UNWIN. Phase contrast electron microscopy of biological materials	299
D. J. JOHNSON and D. CRAWFORD. Defocusing phase contrast effects in electron microscopy	313
J. P. BALDWIN, E. M. BRADBURY and I. F. McLuckie. Electron diffraction analysis and techniques for studying polypeptides and other polymers	325

JACQUES DUBOCHET. High resolution dark-field electron microscopy	334
R. T. Murray. The possibilities for electron diffraction in biology	354
Frantz Perrier. Aspects of dark-field electron microscopy	352
JOHN A. CHANDLER. Recent developments in analytical electron microscopy	359
ROBIN A. WILLIS. Optimization of stereoscopic and high angle tilting procedures for biological thin sections	379
B. Hudson. The application of stereo-techniques to electron micrographs	396
B. E. P. BEESTON. High voltage microscopy of biological specimens: some practical considerations	402
C. J. D. CATTO and K. C. A. SMITH. Resolution limits in the surface scanning electron microscope	417
A. Hepworth and J. Sikorski. Stereoscopy of cylindrical objects in the scanning electron microscope	436
A. BOYDE. Quantitative photogrammetric analysis and qualitative stereoscopic analysis of SEM images	452
Rook Reviews	473

